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30873	7590	11/13/2006	EXAMINER TURNER, SAMUEL A	
DORSEY & WHITNEY LLP INTELLECTUAL PROPERTY DEPARTMENT 250 PARK AVENUE NEW YORK, NY 10177			ART UNIT 2877	PAPER NUMBER

DATE MAILED: 11/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center">Office Action Summary</p>	<p>Application No.</p> <p>10/501,268</p>	<p>Applicant(s)</p> <p>GUILLERMO ET AL.</p>	
	<p>Examiner</p> <p>Samuel A. Turner</p>	<p>Art Unit</p> <p>2877</p>	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 48-107 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 48-107 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/16/06, 9/11/06</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Title

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Abstract

The abstract of the disclosure is objected to because the abstract must be on a separate sheet. Correction is required. See MPEP § 608.01(b).

Drawings

The drawings were received on 21 August 2006. These drawings are accepted by the Examiner. The objection to figures 3 and 8 is withdrawn.

Declarations under 37 CFR 1.131

The declaration filed on 21 August 2006 under 37 CFR 1.131 is sufficient to overcome the Horii et al(6,687,010) reference.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 48-97, and 101 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to

reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

With regard to claims 48, 70, and 101; these claims contain the limitation “along a particular direction, the intensity distribution is approximately constant for at least a predetermined distance”. The application as originally filled contains no disclosure to any intensity distribution being constant for a predetermined distance and is therefor new matter and must be removed.

With regard to claims 58, 66, 80, and 94; these claims contain the limitation “the intensity distribution full width at half maximum is less than 10 μm ”. The application as originally filled contains no disclosure to any intensity distribution having the intensity distribution full width at half maximum of less than 10 μm and is therefor new matter and must be removed.

With regard to claims 62 and 84, these claims contain the limitation “along a particular direction, widths of at least two sections of the intensity distribution are approximately the same”. The application as originally filled contains no disclosure to any intensity distribution having widths of at least two sections which are approximately the same and is therefor new matter and must be removed.

With regard to claims 52, 74, and 88; these claims contain the limitation “wherein the second arrangement is an annulus”. The application as originally filled provides disclosure for “an annulus of light” in regard to the axicon lens and not an as optical element and is therefor new matter and must be removed.

With regard to claims 55,77,and 91; these claims contain the limitation "the intensity distribution is a Bessel beam". This limitation cannot be found in the originally filed application and is therefor new matter and must be removed.

With regard to claims 60,67,82,and 96; these claims contain the limitation "at least a portion of the intensity distribution includes a non-Gaussian distribution". This limitation cannot be found in the originally filed application and is therefor new matter and must be removed.

Note that support for a hologram is found in original claim 18.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 58, 66, 80, 94, 98, 99, and 102-105 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 58, 66, 80, and 94 are confusing in that a full width at half maximum refers to the light source while the transverse resolution Δr of about 5-10 μm , preferably less than or equal to 5 μm . Not any intensity distribution. It is indefinite as to whether these claims are drawn to the source or the transverse resolution. For purposes of this rejection this limitation will be taken as the transverse resolution.

Claim 98 contains the limitation "third arrangement allowing at least one second portion of the electro-magnetic radiation is provided in a center of the electro-magnetic radiation to pass there through". This claim is confusing in that appears that something is missing between "the electro-magnetic radiation" and "is provided". For purposes of this action the limitation will be treated as -- third arrangement allowing at least one second portion of the electro-magnetic radiation provided in a center of the electro-magnetic radiation to pass there through".

In claim 99 there is no antecedent basis for "third arrangement". Antecedent basis is found in claim 98. For purposes of this rejection, this claim will be treated as dependent on claim 89.

With regard to claim 102, this claim includes the limitation to "a plurality of transceiver channels" which refer to widths of approximately the same intensity distribution. This claim is confusing in that the only multi-channel system disclosed are the fiber arrays of figures 6 and 7 which refer to focused spots and not widths. For purposes of this rejection, this claim will be treated as dependent on claim 100.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 48, 49, 52, 56, 57, 62, 63, 65, 69-71, 74, , 78, 79, 84, 85, 88, 92, and 93 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Hill(6,091,496).

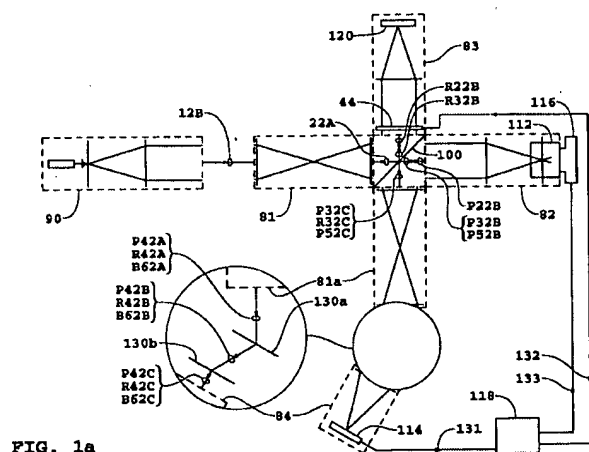


FIG. 1a

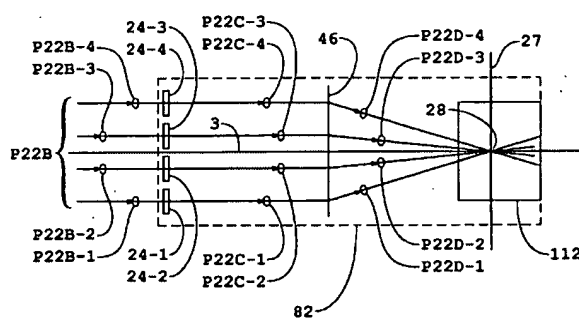


FIG. 1d

With regard to claim 48, Hill teaches an apparatus for imaging at least a portion of a sample (fig. 1a), comprising:

a first interferometric arrangement providing an electro-magnetic radiation (Fig. 1a, the Michelson interferometer); and

a second arrangement configured to receive the electromagnetic radiation (Fig. 1d, 46), and configured to generate a resultant electromagnetic intensity distribution, wherein, along a particular direction, the intensity distribution is approximately constant for at least a predetermined distance (column 38, lines 3-9; and column 25, lines 1-15).

As to claim 49, wherein the second arrangement is an optical arrangement which is configured to optically image the sample(Fig. 1a, 114; column 44, lines 47-65).

As to claim 52, , wherein the second arrangement is an annulus(column 64, lines 30-32).

As to claim 56, further comprising a third arrangement adapted to cooperate with the second arrangement so as to translate at least one of the intensity distribution and the sample(Fig. 1a, 116; column 46, line 64- column 47, line 2).

As to claim 57, wherein the translation of the at least one of the intensity distribution and the sample produces an image which has 2 or more dimensions(Fig. 1a, 116; column 46, line 64- column 47, line 2).

With regard to claim 62, Hill teaches an apparatus for imaging at least a portion of a sample(fig. 1a), comprising:

a first interferometric arrangement providing an electro-magnetic radiation(Fig. 1a, the Michelson interferometer); and

a second arrangement configured to receive the electromagnetic radiation(Fig. 1d, 46), and configured to generate a resultant electromagnetic intensity distribution, wherein, along a particular direction, widths of at least two sections of the intensity distribution are approximately the same(column 38, lines 3-9; and column 25, lines 1-15) this would read on two sections of the Hill scan line.

As to claim 63, wherein the particular direction is approximately a vertical direction(column 25, lines 1-15).

As to claim 65, wherein one of the sections is at least partially above another one of the sections(column 25, lines 1-15) one section of the scan line is deeper into the sample.

As to claim 69, further comprising a third arrangement adapted to cooperate with the second arrangement so as to translate at least one of the intensity distribution and the sample(Fig. 1a, 116; column 46, line 64- column 47, line 2).

With regard to claim 70, Hill teaches a method for imaging at least a portion of a sample, comprising:

a) providing an electromagnetic radiation using an interferometric arrangement(Fig. 1a, the Michelson interferometer);

b) receiving the electromagnetic radiation and generating a resultant electromagnetic intensity distribution, wherein, along a particular direction, the intensity distribution is approximately constant for at least a predetermined distance(column 38, lines 3-9; and column 25, lines 1-15).

As to claim 71, wherein step (b) is performed using an optical arrangement which is configured to optically image the sample(Fig. 1a, 114; column 44, lines 47-65).

As to claim 74, wherein step (b) is performed using an annulus(column 64, lines 30-32).

As to claim 78, further comprising a third arrangement adapted to cooperate with the second arrangement so as to translate at least one of the intensity distribution and the sample(Fig. 1a, 116; column 46, line 64- column 47, line 2).

As to claim 79, wherein the translation of the at least one of the intensity distribution and the sample produces an image which has 2 or more dimensions(Fig. 1a, 116; column 46, line 64- column 47, line 2).

With regard to claim 84, Hill teaches a method for imaging at least a portion of a sample, comprising:

providing an electromagnetic radiation using a interferometric arrangement(Fig. 1a, the Michelson interferometer); and

receiving the electromagnetic radiation, and generating a resultant electromagnetic intensity distribution, wherein, along a particular direction, widths of at least two sections of the intensity distribution are approximately the same(column 25, lines 1-15) one section of the scan line is deeper into the sample.

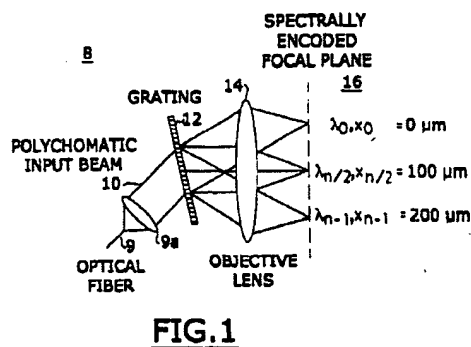
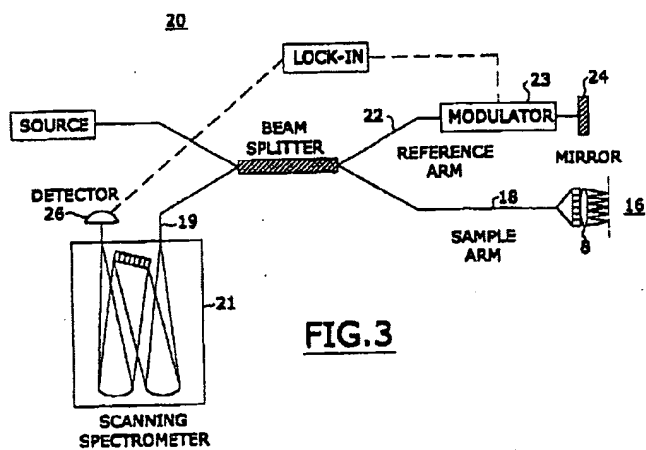
As to claim 85, wherein step (b) is performed using an optical arrangement which is configured to optically image the sample(Fig. 1a, 114; column 44, lines 47-65).

As to claim 88, wherein step (b) is performed using an annulus(column 64, lines 30-32).

As to claim 92, further comprising translating at least one of the intensity distribution and the sample(Fig. 1a, 116; column 46, line 64- column 47, line 2).

As to claim 93, wherein the translation of the at least one of the intensity distribution and the sample produces an image which has 2 or more dimensions(Fig. 1a, 116; column 46, line 64- column 47, line 2).

Claims 100-102, and 107 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Webb et al(WO 99/44089).



With regard to claim 100, Webb et al teach an apparatus for imaging at least a portion of a sample, comprising:

a first interferometric arrangement providing an electro-magnetic radiation(fig. 3, 20); and

a second arrangement configured to receive the electro-magnetic radiation, and configured to generate a resultant electro-magnetic intensity distribution,

wherein, along a particular direction, a plurality of focal points of the intensity distribution are generated(fig. 1, 8; page 3, line 15-page 4, line 7).

As to claim 101, along a particular direction, the intensity distribution is approximately constant for at least a predetermined distance(fig. 1, 8; page 3, line 15-page 4, line 7).

As to claim 102, wherein the second arrangement includes a plurality of transceiver channels(fig. 1, 8; page 3, line 15-page 4, line 7).

As to claim 107, Webb et al teach a method for imaging at least a portion of a sample(page 4, line 17-page 5, line 6), comprising:

providing an electro-magnetic radiation using an interferometric arrangement(fig. 3, 20); and

receiving the electro-magnetic radiation, and generating a resultant electro-magnetic intensity distribution, wherein, along a particular direction, a plurality of focal points of the intensity distribution are generated(fig. 1, 8; page 3, line 15-page 4, line 7).

Claims 98, 99, and 106 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Erdélyi et al(J. Vac. Sci. Technol. B 1997).

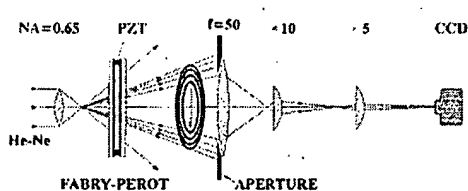


FIG. 1. Schematic diagram of the experimental setup. The aperture of the objective lens transmits the first Fabry-Pérot ring and blocks all other rings. The image was magnified by means of two microscope objectives and observed with a CCD camera.

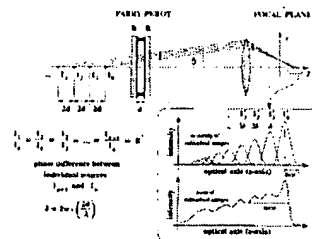


FIG. 2. The image produced by the objective lens is the superposition of the images ($I_0, I_1, I_2, \dots, I_N$) of the individual point sources. Therefore, N relative image density is an important factor in determining the shape of the axial intensity distribution.

With regard to claim 98, Erdélyi et al teach an apparatus for imaging at least a portion of a sample(preamble), comprising:

a first interferometric arrangement providing an electro-magnetic radiation(Fabry Perot); and

a second arrangement configured to receive the electro-magnetic radiation, and configured to generate a resultant electro-magnetic intensity distribution(lenses), wherein the second arrangement including a third arrangement which is configured to at least partially block at least one first portion of the electro-magnetic radiation(aperture), the third arrangement allowing at least one second portion of the electro-magnetic radiation is provided in a center of the electro-magnetic radiation to pass there through(see figures 1 and 2).

As to claim 99, wherein the third arrangement is a masking arrangement which includes a section in a center thereof which allows the at least one second portion to pass there through(aperture).

With regard to 106, Erdélyi et al teach a method for imaging at least a portion of a sample(preamble), comprising:

a) providing an electro-magnetic radiation using an interferometric arrangement(Fabry Perot);

b) receiving the electro-magnetic radiation and generating a resultant electro-magnetic intensity distribution(lenses), wherein at least one first portion of the electro-magnetic radiation is at least partially blocked by a particular

arrangement(aperture), and wherein at least one second portion of the electro-magnetic radiation provided in a center of the electro-magnetic radiation is allowed to pass through the particular arrangement(see figures 1 and 2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 54, 58, 59, 66, 76, 80, 81, 90, 94, and 95 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hill(6,091,496).

As to claims 54, 76, 90; Hill fails to teach an apodized lens or diffractive element. Hill teaches that the phase shifters(Fig. 1d, 24) can be apodized to reduce the magnitude of the out-of-focus images.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Hill apparatus to apodize the lens 46 instead of the plurality of phase shifters.

The motivation for this modification is the reduction of elements needed to be apodized. Otherwise this would not change the beam paths from the apodized phase shifters.

As to claim 58, 66, 80, and 84; Hill fails to teach wherein the transverse resolution is less than 10 μm . Hill teaches that the length of the length of the line image is determined by a combination of factors such as the depth of focus and chromatic aberration of probe lens 46 both of which can be adjusted and the optical bandwidth of the source.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the probe lens 46 to a transverse resolution of less than 10 μm by adjusting the lens.

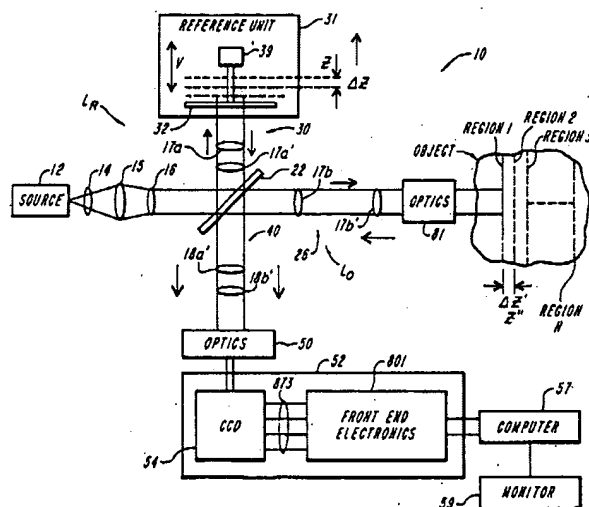
The motivation for this modification would have been an improvement in the scan resolution which is why the probe lens is adjustable.

As to claims 59, 81, and 95; wherein the predetermined distance is at least 50 μm which is the longitudinal resolution. Hill teaches that the length of the line image is determined by a combination of factors such as the depth of focus and chromatic aberration of probe lens 46 both of which can be adjusted and the optical bandwidth of the source

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the probe lens 46 to a longitudinal resolution of at least 50 μm by adjusting the lens.

The motivation for this modification would have been an improvement in the scan depth which is why the probe lens is adjustable.

Claims 61, 83, and 97 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hill(6,091,496) as applied to claims 54, 58, 59, 66, 76, 80, 81, 90, 94, and 95 above, and further in view of Swanson(5,465,147).



As to claims 61 83, and 97; Hill fails to specifically teach a fourth arrangement configured to received information that is associated with the intensity distribution, and display an image based on the received information. Swanson teaches the missing display.

Swanson teaches a display to the image for user control(column 6, lines 54-58).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Hill apparatus to display the final image.

The motivation for this modification is the obvious need to display the image output to obtain the final image for operator control.

Claim 64 is rejected under 35 U.S.C. 103(a) as applied to claims 54, 58, 59, 66, 76, 80, 81, 90, 94, and 95 above, and further in view of Erdélyi et al.

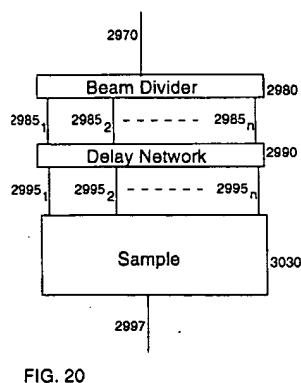
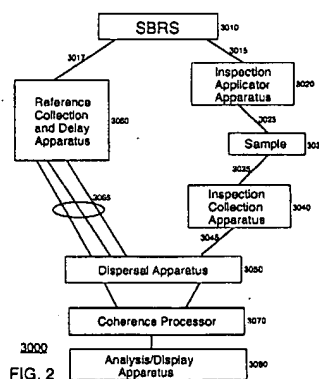
As to claim 64, Hill fails to teach second arrangement which includes a plurality of lenses.

Erdélyi et al teach using a plural lens system to control the length of the axial line projected.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Hill apparatus to add additional lenses.

The motivation for this modification is found in Erdélyi et al to control the length of the axial line projected.

Claims 103-105 are rejected under 35 U.S.C. 103(a) as being unpatentable over Webb et al(WO 99/44089) in view of Li(5,892,583).



As to claims 103 and 24, Webb et al fail to teach wherein each of the channels is situated in an individual waveguide or where least one of the waveguides is a optical fiber.

Li teaches that each channel can be fed to a plurality of optical fiber waveguides with differing lengths(column 6, lines 22-32) in order to scan the sample in different areas and at different depths(column 34, lines 39-48).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Webb by placing optical fibers with different lengths in the image plane at the objective lens focus point. Another alternative would replace the fiber 9 with an array of optical fibers with different lengths.

The motivation for this modification is found in Li which teaches the use of the optical fibers as delay lines to scan a plurality of locations and differing depths simultaneously(see figures 2 and 20).

As to claim 105, Webb fails to teach wherein the second arrangement includes a plurality of lens, each of the lens being in an optical communication with a separate one of the waveguides.

Li teaches that "an optical path can be fabricated using bulk optical components such as lens systems, reflectors, prisms and so forth, optical fibers, optical waveguides, integrated optical components, and any combinations of the foregoing (including any which are known to, or can be designed by, those skilled in the art)"(column 6, lines 22-27).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Webb apparatus by placing a plurality of lenses, a lens system, at the end of each optical fiber waveguide.

The motivation for this modification is to focus the light to the specific points desired as shown by the Webb objective lens(see figures 2 and 20).

Response to Arguments

Applicant's arguments with respect to claims 48-107 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel A. Turner whose phone number is 571-272-2432.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached on 571-272-2800 ext. 77.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Samuel A. Turner
Primary Examiner
Art Unit 2877